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ABSTRACT

The question of whether the term "intermediate skills" has a distinctive meaning across business and industry in the United Kingdom and in its major competitors was examined. The study focused on the following sectors: housing construction; broadcasting; the care sector; the exercise, health, and fitness sector; and engineering (high tech as well as fabrication and welding). Structured interviews were conducted with members of the following groups: employers; education and training providers; sector skills council members; members of professional associations; and members of the Centres of Vocational Excellence network. The definition of intermediate skills was not uniform across business and industry. However, a mix of new and traditional skills appeared to be needed by people in jobs located between operative and professional levels. Intermediate skills appeared related to a grouping of skills, knowledge, and attributes required to perform satisfactorily in intermediate-level jobs that must be defined by individual employment sectors. The blanket use of terms such as "intermediate skills" appeared to be of limited value in the formulation of education and training policy. Greater clarity in what constitutes a "qualification" and what employers can expect in terms of new recruits' skills, knowledge, and

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experience and what they themselves need to provide in terms of induction and further specific training appeared warranted. (The interview responses and series introduction are appended. Forty-five endnotes are included.) (MN)

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investigating intermediate skills

Barry Smeaton
and Maria Hughes

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Summary

- While the definition of intermediate skills may not be uniform across business and industry, or necessarily required by the mass of the workforce, a mix of new and traditional skills appear to be needed by people in jobs located between operative and professional levels. Intermediate skills seem to be critical for some of the workforce in order to secure productivity and competitiveness.
- However, determining what is meant by 'skilled employment' may require further consideration. Jobs requiring few skills have largely disappeared and the skills sought by employers are increasingly being described in terms of a mix of different types of skills, rather than as a precise level of a vocational skill.
- Intermediate skills appear to be related to a grouping of skills, knowledge and attributes required to perform satisfactorily in intermediate level jobs, which must be defined by individual employment sectors.
- Intermediate skills are located in a hierarchy of skills above routine skills and below professional skills, but the level in relation to the national qualifications framework and the type of skill associated with intermediate skills varies across sectors and occupations. They are not necessarily the threshold skills that relate to general employability, but they are required to operate effectively in jobs with a relatively high level of skills and fair degree of responsibility.
- In defining intermediate-level *skills* within an occupational sector, it is necessary to define the type, range and level of all the skills required by the intermediate-level *jobs* within that sector; the vocational, generic and personal skills. This skill set is unlikely to be embodied within a single qualification.
- The blanket use of terms, such as intermediate skills, is of limited value in the making of education and training policy. Terms such as 'skills' and 'intermediate level' have changed to meet the changing demands of occupational sectors and sub-sectors, and their definition is specific to these contexts. Strategic planning of skills' supply should take these differences into account.
- In particular, further development of the Centres of Vocational Excellence (CoVE) network, as the major initiative in developing skills supply, requires a more informed awareness of their role in setting the benchmark for higher-level skills and workforce development, rather than skills development at all levels.
- Greater clarity is required in what constitutes a 'qualification', and what employers can expect in terms of the skills, knowledge and experience of new recruits and what they themselves need to provide by means of induction and further, specific training.
- If the intermediate skills that underpin productivity and competitiveness are to be developed, companies need to put in place structured induction or 'internship' , where the skills and knowledge that can only be acquired on the job are delivered as part of a planned training programme.

Introduction

The Learning and Skills Development Agency (LSDA) has been investigating whether there is a distinctive meaning of the term 'intermediate skills', and the extent to which these skills are critical in a modern workforce. The research was commissioned by the Department for Education and Skills (DfES) to inform policy in relation to the Skills Strategy and the review of funding of adult learning.

The investigation attempted to answer two sets of questions:

- Is there a distinctive meaning of the term 'intermediate skills' in particular occupational sectors? To what extent is the concept of intermediate level consistent across sectors? Would such consistency be desirable?
- What international comparisons are there of vocational specialisation at intermediate skills levels? What do these tell us about the UK's intermediate skills levels and needs?

Background

Intermediate skills were seen by the National Skills Task Force as the critical point at which the majority of the workforce should operate to compete successfully in a modern economy. The importance of intermediate skills continues to be emphasised in more recent reports. In the Department for Education and Skills update report on the development of a skills strategy[1] one of the principal skills gaps identified is intermediate-level skills for skilled trades, scientific technicians and associate professional jobs. However, there is not a clear definition of what constitutes intermediate skills, and whether this is distinctive or consistent across occupational sectors.

The lack of such a definition may badly affect policy decisions about the allocation of resources to secure an appropriately skilled workforce and the focus of interventions. A clearer definition and better understanding of the relative importance of intermediate skills would better inform policy. Providers and employers could also benefit from a clearer articulation of the meaning and substance of intermediate skills.

There is a lack of clarity about the:

- nature and level of the skills needed by the majority of the workforce to remain economically competitive
- extent to which jobs currently, or in the future, will predominantly require skills at Levels 2 or 3.

Intermediate skills are commonly seen as those embodied within Level 3 vocational qualifications, for example, as one of the criteria for eligibility for entry to the Centres of Vocational Excellence (CoVE) programme. This equation with Level 3 vocational qualifications may not adequately describe the nature and level of complexity of the intermediate skills required in a wide range of jobs. This has implications for the further modernisation of the supply of skills training and the provider network in the range of provision being developed.

The National Skills Task Force described a new generation of intermediate skills as key components of new jobs. These skills included communications, innovation and problem-solving, in effect becoming the 'vocational' skills, rather than the supporting key skills. In traditional sectors, such as engineering, intermediate skills were seen to be about competence in craft level skills, but also to include new skills, so changing the overall skill set.

If a different range of skills is required, the current classification of skills levels may be inappropriate, and a new classification required. An investigation of the need for intermediate skills within real jobs is therefore timely.

Method

During this investigation previously published material relating to intermediate skills and related terms; the UK's international position in its stock and development of intermediate skills; and comparisons between the UK and its major competitor countries was reviewed.

Six sectors relating to the DfES priority sectors in contrasting occupational sectors were investigated in more detail:

- construction, with a focus on house building
- media, with a focus on broadcasting
- the care sector
- the exercise, health and fitness sector
- engineering, considering the skills needs of both traditional industries such as fabrication and welding, and the needs of high-tech industries.

Consultation was undertaken on the definition and nature of intermediate skills and their relevance to particular work contexts by means of structured interviews with employers, education and training providers, Sector Skills Councils, professional associations, and the CoVE network.

Examples of perceptions of intermediate skills identified by the consultation are provided throughout the text and a full summary is provided in the Appendix.

Views on intermediate skills

The development of intermediate skills was the subject of considerable discussion by the National Skills Task Force, which proposed that intermediate skills consisted of:

- vocational skills including the occupational or technical skills
- generic skills – which can be used across large numbers of different occupations – including key skills, reasoning skills, the ability to diagnose problems and to visualise outputs
- personal attributes, such as motivation, judgement, leadership and initiative.

The Skills Task Force Research Paper 4[2] reviewed recent trends in the demand and supply of intermediate-level vocational skills. It noted that intermediate skills have been defined as 'those [skills] above routine skills but below professional ones', ie craft and technical skills, along with similar categories in the service sector. These skills are generally considered to be around National Vocational Qualification (NVQ) Level 3, although research has found that among a number of engineering companies, craft workers required higher skills levels than generally provided by NVQ Level 3.

The intermediate level has been classified as that practised by employees with advanced technical skills and/or by supervisors. But the point is made that levels and types of skill vary considerably across sectors and occupations.

Examples
Intermediate-level skills within exercise, health and fitness are those identified at NVQ Level 2 in coaching, teaching and instructing in all exercise and fitness disciplines. They include the skills demanded by a supervisory position or from lead exercise instructors or personal trainers.

Neither the broadcasting industry nor engineering recognised the term 'intermediate skills'. Representatives of the care sector described the term as non-specific and unhelpful.

Key point
Within a skills hierarchy, intermediate skills appear to be located above routine skills and below professional skills but the level in relation to the National Qualifications Framework and the type of skill associated with intermediate skills varies across sectors and occupations. Intermediate skills are not, therefore, the threshold skills which relate to general employability, but they are needed to operate effectively in jobs with a relatively high level of skills and fair degree of responsibility.

Intermediate-level jobs

Intermediate-level skills may also be defined in relation to intermediate-level jobs.[3] The National Skills Task Force proposed that these include associate professional occupations, clerical and secretarial occupations, and craft and skilled manual jobs. The Task Force gave examples of intermediate-level job titles, including traditional skilled trades, such as fitter, welder and bricklayer, and an immense range of non-craft occupations such as nurse, hairdresser, estate agent, office manager, laboratory technician, insurance broker and sales representative. These examples illustrate the extensive range of roles that could be included in this category.

Examples

Intermediate-level jobs in house building include trade supervisors, trade foremen, site agents, architectural technicians and quantity surveyors.

The term 'intermediate-level jobs' does not have any real meaning in the care sector where occupational standards describe the skills required at each level.

In the broadcasting sector intermediate-level jobs would relate to a range of technical and craft posts concerned with sets, sound and lights, production coordination, engineering, props, editing, administration and research.

Key point
Intermediate skills appear to relate to a grouping of skills, knowledge and attributes required to perform satisfactorily in intermediate-level jobs. Intermediate-level jobs have to be defined by individual employment sectors.

What constitute intermediate skills?

The Skills Task Force Research Paper 4[4] noted that a survey on changes in skills conducted in 1999 found increased need for problem-solving, computing, communication and social skills within intermediate jobs, while manual skills were becoming less important. If intermediate-level jobs require a range of vocational and technical knowledge and skills, generic skills and personal attributes, the definition of intermediate skills should encompass the full set of skills required to carry them out satisfactorily. These skills are unlikely to be embodied within a single subject qualification, although many may be developed within some Advanced Modern Apprenticeships (AMA) or in some job-specific qualifications such as the NNEB Nursery Nursing Awards. Vocational competences are described within NVQs, but these may not include the additional skills and competences required within intermediate jobs and increasingly seen as important by employers.

Key point
In defining intermediate-level skills within an occupational sector, it is necessary to define the type, range and level of all the skills required by the intermediate-level jobs within that sector; the vocational, generic and personal skills. This skill set is unlikely to be embodied within a single qualification as currently described.

Example
The vocational and technical skills required by the majority of the workforce engaged in exercise, health and fitness are set out in the Workforce Development Plan for the sport and recreation sector. This details the top 20 skills ranked by employers within the sector, the top five being:

- communication
- health and safety awareness
- personal skills (interest, motivation, interpersonal skills, leadership)
- key skills such as working with others and customer service
- technical knowledge relating to the discipline.

Defining 'skills'

Keep and Mayhew[5] perceive increasing confusion about the meaning of 'skill'. They propose that previously, skills were taken to be a combination of 'hard' technical skills and knowledge, and a variety of forms of manual dexterity and spatial awareness. The meaning of the term has since expanded, partly as a reflection of the shift in employment towards service

sector occupations, to encompass an additional range of generic skills and personal characteristics such as motivation.

Policy-makers have to grapple with the wider spectrum of skills that a vocational learning system must encompass, in terms of range, type and level. If demands from occupational sectors and sub-sectors are different and divergent, the blanket use of the term intermediate skills may be of limited value in the design and operation of education and training policies. The precise nature of the skills being sought must be carefully specified and made explicit to secure an appropriate response from planners and providers.

This theme is picked up by Hughes and Mager,[6] who argue that the lack of a clear focus to the skills agenda may be partly due to lack of clarity about terms. The term 'skills' is used in a variety of ways, sometimes linked to 'knowledge', 'attitudes' or 'attributes', sometimes as a proxy for these.

Example
Some representatives of the house-building sub-sector of the construction industry recognise the term intermediate skills and associate them with those above trade skills and with levels 3+. Others do not recognise the term as being in common use in the industry.

Success for all[7] reinforces messages about the importance of sectoral approaches, with Sector Skills Councils being central to strengthening the skills focus of providers. A new approach to planning provision is proposed, with strategic area reviews at its heart. Sector divergence in the definition of intermediate skills places greater importance on sectoral and local approaches to planning skills' supply.

Key point
The blanket use of terms such as intermediate skills is of limited value in the making of education and training policy. Terms such as 'skills' and 'intermediate level' have changed to meet the changing demands of occupational sectors and sub-sectors, and their definition is specific to these contexts. Strategic planning of skills supply should take these differences into account.

Determining skill levels

Two dimensions of work were used by the National Skills Task Force to position a job in the skills hierarchy: its complexity and the amount of discretion required to operate effectively.

- The complexity of a job and of the skills required varies according to the techniques, simplicity or complexity of procedures, and the number and range of tasks involved.

It also depends on the technical knowledge needed about equipment, the product, processes and how different stages fit together.

- Discretion refers to choice and employees' potential to exercise judgement.

Example

For the majority of the workforce to perform effectively in the broadcasting industry vocational skills at levels 3+ are required. These include:

- IT skills
- a good basic technical competence in the handling and maintenance of equipment
- health and safety awareness.

Personal skills required by the majority of the workforce are:

- good teamwork
- organisational, negotiation and communication skills
- ability to freelance.

Key point

Jobs require a range of skills. It is the relative weight of the different skills that determines a job's place in the skills hierarchy.

Intermediate skills and qualifications

The consultation with sector representatives[8] shows that the levels of skills required to perform at intermediate level varies considerably across sectors. Although NVQs are allocated to a nationally prescribed level, they are neither the same level nor the same size in different sectors.[9] For instance, engineering qualifications consistently take longer to achieve than those in retail. Placing qualifications at the same level on the qualifications framework disguises a multitude of differences.

NVQ levels are determined by the type, range and complexity of skills required by the various jobs in an individual sector's occupational hierarchy. In traditional terms, this means that the level of skill is associated with the respective position of job roles in the workforce, with a rising level of skill from operators, crafts persons and technicians.

Example
Although the level of skill needed by most of the workforce in engineering is Level 3, most of the house-building workforce require NVQ Level 2 trade skills. These are the basic skills mainly needed for site working by tradesmen – bricklayers, joiners, plasterers, carpenters, painters, roofers, tilers – often working on new buildings and refurbishments. Level 3 trade skills tend to include higher-level decorative work.

Key point
Intermediate skills are not associated with one particular level of qualification. Reference is made in different contexts to intermediate skills at NVQ Levels 2, 3 and 4.

Academic levels are determined in quite a different way and yet both vocational and academic qualifications are included in the same National Qualifications Framework (NQF) and have the same levels attributed to them. Even between occupations there are differences. 'Craft' in one occupation and sector will be more complex than in another, and some occupations require more levels than others. Also, although academic qualifications are designed to be progressive, NVQs are not. One level does not guarantee entry to the next, and, conversely, a Level 2 is not always a prerequisite for entry to a Level 3 qualification.

Key point
NVQ levels are not the same, and do not encompass the same level of skill, across all occupational sectors. Their relationship to levels within academic qualifications is weak. NVQ levels are determined by the type, range and level of skills needed by the jobs in a sector's occupational hierarchy. This has implications for the definition of intermediate skills within sectors.

The *Funding adult learning: technical document* (LSC March 2003) proposes the development of a holistic qualification. It suggests that:
'A defined volume, level and combination of learning, representing a 'full' Level 2 made up of a broad skill set including both general and specialised skills, would provide a readily identifiable level of attainment.'

While there may be operational difficulties in securing participation in such an ambitious learning programme by people already at work, the proposal acknowledges the need for an overarching qualification that contains the full set of skills needed to operate at Level 2 in the workplace. Similar learning programmes and qualifications to develop intermediate skills within sector or occupationally specific contexts would be useful.

Demand for intermediate-level qualifications

Despite great efforts of government and its agencies, the take-up of NVQs remains low in proportion to the increasing take-up of other vocational qualifications. The total number of NVQ/SVQ certificates awarded up to September 2001 was just over 3.5 million.[10] Most of the certificates awarded (60%) are at Level 2, and 19% at Level 3. At Levels 4–5, certification has remained at 3% of the total, with the greatest take-up in management qualifications. In contrast the take-up of other vocational qualifications continues to rise.

There appears to be a strong demand for training and qualifications, particularly for in-service training/upskilling, which is provided in free-standing units and can be taken by those who need the specific element of training offered and no more. Stanton argues[11] that qualifications and occupational structures would need to be re-structured to allow for such choices by individuals. There is a demand for qualifications that are sufficiently flexible to meet the specific skill needs of employers and employees.

The government's Public Service Agreement (PSA)[12] targets tend to focus primarily on qualifications. However, consideration may need to be given whether the qualifications on offer will deliver the skills needed by employers and the economy.

Examples

Within the broadcasting industry there is dissatisfaction with NVQs because they do not adequately reflect the range of skills required by the majority of the workforce. They are seen as too complicated, inflexible and not relevant to the needs of employers. NVQs are not being used by much of this sector.

Much of the broadcasting industry is not using the current classification of skill levels. A new classification of skills, which focused on 'standards' and not levels, would be welcome. This aspect of skills development and classification needs more research but the sector would welcome a 'pick-and-mix' system that better reflected the skills required by staff and freelancers.

In contrast, many employees in engineering are 're-qualifying' through NVQs.

Those who are dissatisfied with the present system see the need for highly specialist, sometimes equipment-specific skills, as lacking in current qualifications. Skills such as team working are also considered important. Increasingly, the 'technical' skills required may be non-engineering technical skills, for example those related to finance, management and human resources. Some argue that what is needed is further unitisation of NVQs and recognition of distance travelled through training.

Key point

The type and level of training needed by individuals and employers as preparation for entry to employment is different from that needed by mature workers. Attributing the same level of training and qualification to pre-service training and in-service training does not seem to be logical.

Qualifications as a proxy for skills

Government frequently uses the qualifications held by the workforce as a proxy indicator for the skills of the workforce. Qualifications are useful indicators of trends in the supply of skills because of the availability of detailed statistical information about qualifications held. But there are problems associated with this equation because many generic skills and personal attributes are not certificated, and skill levels are likely to be under-estimated, as a large proportion of learning does not lead to qualifications.

The number of qualifications held by the workforce is rising because those entering the workforce hold more qualifications than those leaving it. This does not necessarily mean that the workforce is now better able to perform, given that these qualifications may be

unrelated, or have a weak relationship, to the range of skills and knowledge required in particular contexts.

Changing skills needs

The Task Force's *Employers' skills survey* of 1999 investigated how skills have changed over time by looking at the distribution of jobs by occupation. The most striking occupational change over the past 20 years has been the shift in employment from manual to non-manual jobs, and the expansion of jobs (27%–36% of the workforce between 1971 and 1998), in the managerial, professional and associate professional categories. These jobs require high-level technical, cognitive and problem-solving skills.

Technological change and the use of IT have played an important role in driving skills growth across many sectors, and the skill demands are likely to continue to rise. But this growth is not uniform across the labour market. Low-skilled manual workers are less likely to have experienced an increase in skill levels than their counterparts in intermediate and higher level occupations, for whom increased task discretion and the widespread use of computers have moved their ranking up in the skills hierarchy.

Changing practice in the way that organisations are managed and structured has also influenced the skills set required. In some cases the levels of responsibility of workers at quite junior levels has increased, which may be a key reason for the apparent rise in jobs requiring intermediate skills in the service sector. In manufacturing, more skilled trade workers are expected to be multi-functional. This has resulted in a greater blurring of the boundary between traditional craft- and technician-level jobs, and a widening of skills needed by many craft-level workers. Organisations have become smaller and flatter, which has driven down the responsibility for decision-making to individual members of staff at lower levels. This reinforces the view that further dimensions of intermediate skills include judgement and decision-making.

Example
Within the construction industry there is a shortage of workers with the multi-skills required by small building companies. In broadcasting, more multi-skilling will be required at all levels. In engineering, many workers will need a broader range of technical skills and to be multi-skilled rather than specialists.

Key point
The number and range of intermediate-level jobs has increased due to growth in service industries as a percentage of all jobs and changing technology and new organisational structures.

Another important shift in jobs at the intermediate level is the movement from lower level intermediate jobs (traditional skilled-trade/craft jobs) to higher-level intermediate jobs with associate professional status. This shift is driven by a change in the nature of jobs carried out at this level, while jobs in the middle (ie secretarial and clerical jobs) are fairly static.

Example
In the aircraft industry the workforce needs to be constantly being updated, retrained and multi-skilled. There is a constant increase in applications of new technologies, and this has a knock-on effect on the existing workforce that needs to be retrained in other skills. For example, there is a current shortage of skilled electricians and in some companies fitters are being retrained so that they can take on the lower level electrician tasks, allowing the skilled electricians to concentrate on advanced work.

Key point
There is greater stratification in the level and type of skills required by intermediate-level jobs as a result of new jobs at associate professional level.

Intermediate skills in a modern economy

Visions of a knowledge-driven economy[13] foresaw a world in which livelihoods rely increasingly on ideas and knowledge. While traditional assets still matter, the real assets of the modern economy come from ideas, knowledge, skills, talent and creativity. With continuing advances in technology and smart machines taking away the drudgery of working life, economic and social value is not just created by what people know but by the creative application of knowledge.

Hughes and Mager[14] relate these theories to vocational learning and the skills agenda. If significant changes to the way people live, work and learn result from a knowledge-driven economy, the capacity to adapt in the face of uncertainty and flux becomes increasingly important. They suggest that even if only a fraction of these predicted changes take place, skills needs are changing rapidly and this trend will continue. The authors consider implications for skills development resulting from changes in employment trends, noting that the switch from jobs for big manufacturing companies to small, service-industry firms makes much rarer the model of a career in which an employee works up the ladder in a single company. Large companies contract out their non-core activities to specialist companies, or use more temporary workers than in the past. The upgrading of skills is seen as the best defence against unemployment, but this may need to be an individual, not corporate, responsibility.

However, the effects of the knowledge-driven economy may not be equally apparent in all sectors. An examination of the health service[15] concluded that 'many people who are now very well paid will become redundant, and many low-status, badly paid jobs will become increasingly needed. This is an unexpected feature of the technological revolution... What computers cannot do is take pulses, empty bedpans or feed frail, elderly patients.'

As demand for these caring services increases to a level which matches or exceeds supply, the value placed on them could increase and wages could rise, although the relative currency of high- and low-tech skills is difficult to predict.

Example
In nursing homes the bulk of the work is at Level 2. The Care National Standards Commission has required that 50% of the workforce will be trained and qualified to Level 2 by 2005. At this level of training employees are typically engaged in personal care in residential care and home care, dealing with clients' needs over 24 hours, working with the elderly, and working with people with learning disabilities and mental health problems.

Changes in work practices tend to affect larger firms more than smaller ones, and these differences need to be taken into account within the qualifications system and by policy-makers and providers.

Keep and Mayhew [16] reiterate the view that the knowledge-driven economy does not apply across all sectors, but applies to those such as IT, pharmaceuticals, software, consultancy that require abstract, theory-based, high-level knowledge, rather than the tacit knowledge ('know-how') which is of particular importance in the service sector.

What can be extrapolated from recent trends is the likelihood that the pace and nature of these changes will be different in different sectors. The skills implied by 'intermediate level' will continue to differ and to diverge from one sector to another.

Key point
The knowledge-driven economy will continue to change and to demand and prioritise a new range of skills. The pace of change will differ between occupational sectors. The definition of intermediate skills is, therefore, likely to continue to diverge from sector to sector.

Demand for intermediate skills

Andy Westwood[17] refers to Keep and Mayhew's view that the demand for skills within the education system, which has risen sharply in the past 10 years, has not resulted in an equivalent growth of demand for higher skills from employers. Graduates, and also

school and college leavers, are employed in less skilled jobs than their qualification level would have previously merited. While employers have become increasingly more discerning in their attitudes to education and skills, this has not been matched by an equivalent increase in the number of higher skilled jobs available in the labour market. Keep and Mayhew's view is that entry criteria to the labour market are increasing without reference to the actual demands of the job.

Example
In the broadcasting sector intermediate-level jobs would be those relating to a range of technical and craft posts. Increasingly, graduates are taking some of these jobs.

An alternative view could be that despite these higher levels of skills being held by more people entering the workforce, there is a shortage of applicants qualified on entry to do the job for which they are employed. It may also reflect the growth of the 'new' higher intermediate-level jobs in the service sector where graduate-level entry is much more common. It is probably also an inevitable result of the fact that there are now more graduates in the labour market

Being a graduate does not necessarily qualify the holder to do anything, unless the degree was highly vocationally specific. The absence of qualifications that actually provide the skills and knowledge that pertain to specific jobs means that all manner of qualifications are being used as a proxy to select and recruit people into the workforce. LSDA's response to an initial soundings paper from QCA[18] noted that there is a case for clarifying terminology associated with qualifications and awards. In particular, it may be helpful to establish a more precise definition for the term 'qualification'. For example, while the term qualification seems appropriate to describe achievement that implies licence or competence to practice, it does not seem appropriate to describe the outcomes of a short updating course.

Employers complain about the quality of graduates applying for technical jobs, referring to a lack of work experience, commercial understanding and generic skills. However, these skills are most readily acquired through employment-based training: learning experiences to which graduates have limited access before starting their career. Greater recognition of the need for specific induction to jobs is required to develop those aspects of intermediate skills that cannot be acquired before being employed. Development of the notions of apprenticeship or internship may be helpful in tailoring employees' skills and knowledge to the needs of the job.

Key points

Graduate employment in higher intermediate-level occupations has increased in line with the growth in jobs at this level in the service sector. This may reflect a genuine increase in the higher skill needs of these jobs, or may be caused by other factors, such as the use of higher level qualifications as filters in the recruitment process.

Greater clarity is required in what constitutes a 'qualification', and in what employers can expect in terms of the skills, knowledge and experience of new recruits and what they themselves need to provide by means of induction and further, specific training.

Is there a substantial shortage of intermediate skills?

The DTI[19] has long argued that people's skills must be continually upgraded or the country's competitiveness will decline. Although the UK has a high level of graduates compared with other countries, there are too many people with low-level skills and a labour market shortage of people with intermediate-level qualifications. The DTI suggests that better initial education will take a generation to raise the quality of the workforce as a whole. Therefore there is an urgent need to develop the skills of those now in work, and throughout their working lives. This imperative has also been emphasised more recently by HM Treasury and the DfES,[20] and is a major factor in the rationale for the LSC's workforce development strategy.[21]

The *Employers' skill survey*[22] (DfES 1999) found that 48% of all skill shortages were in intermediate-level jobs, with 35% of these being in associate professional jobs and a further 45% in craft-level jobs. The survey also reported that the UK continues to have a problem with the supply of qualified young people with craft-related vocational qualifications at Levels 2 and 3. Falling numbers taking traditional technician and associate professional-level qualifications compounds this problem. The number of registrations with Edexcel for HNC and HND courses in engineering, technology and manufacturing is reported to have fallen by over 40% since 1989/90. The use of graduates to fill intermediate-level jobs in the absence of applicants with technician and associate professional qualifications, may contribute to complaints from employers that graduate recruits have inadequate technical and commercial skills.

The changing nature of craft jobs requires multi-skilling – for example, combining traditional craft work with maintenance tasks previously undertaken by technicians – and multi-functioning – for example, the need to be able to schedule work, to liaise with customers and work within a team environment. These skills have not been developed through qualifications, making it difficult to find people with the range of skills needed to perform effectively at intermediate level.

Example
In engineering there is a particular problem with maintenance staff previously rigidly classified as fitters, electricians, etc who now require training in multi-skilling.

The survey concludes that these circumstances make the intermediate-level skills, and particularly associate professional level (Level 4), the most significant skills shortage challenge faced by the UK. Although it is a challenge that crosses many sectors and occupations, this occupational level represents the most serious skills shortages in the manufacturing, construction, financial services, business services, public administration and health and social work sectors, and is a significant problem in transport and communications.

More recently, the LSC's *Skills in England* report[23] found that priorities for investment in skills include the areas of basic skills, intermediate-level skills and vocational skills as well as higher-level academic qualifications. It also commented that:

- the supply of skills is growing but there are still problems with basic skills, intermediate-level skills and some generic skills
- the demand for skills is changing dramatically, often resulting in significant imbalances at local level
- the intensity of skill demand is increasing, both in terms of formal qualifications and key and generic skill requirements
- meeting replacement demands will be a major challenge for many declining sectors and occupations
- the further development of managerial skills is also a high priority
- concerns about over-qualification and over-supply of graduates are misplaced but continued monitoring is required
- many skill issues have important local dimensions which require continued research and monitoring
- some of these local aspects are related to specific sectoral skill concerns which also require further investigation
- there is a need to improve the relevance and distribution of training in the workplace
- there is a strong case that the demand for skills needs to be increased, as part of a general policy to improve productivity and performance.

Key point
Reports have suggested that the UK's most significant skills shortage lies with people with intermediate skills. The emphasis on practical, technical and generic skills, together with the need for multi-skilling and multi-functioning are making it difficult for employers to find the people with the skills needed. This may be due in part to the lack of vocational learning provision that develops these skills, and to the weak demand for such learning from young people.

Example
In broadcasting there are difficulties in recruiting people for IT-based developments in the industry. Shortages are particularly acute in the area of interactive entertainment, in which the production of games requires programmers and designers at the highest level. Generally in the multimedia area there are shortages. Web designers are still in short supply. Production accountants are always scarce. There are shortages in engineering at all levels, among production managers and coordinators, producers and among people with financial skills.

Skills shortages and skills gaps

The *Employers' skills survey*[24] indicated that hard-to-fill vacancies varied by size of establishment, sector and region. About half were 'skill-shortage vacancies' relating to a lack of applicants with the required technical skills, qualifications or experience. The greatest volume of skill-shortage vacancies was in associate professional occupations (17% of all skill-shortage vacancies), and in craft and related occupations (22%), predominantly in manufacturing and construction.

Technical and practical skills other than IT, followed by communication, customer-handling and team-building were reported as being in short supply, but with variations between occupations. Technical/practical skills were especially rare among craft and skilled manual occupations, communication skills were lacking in applicants for sales vacancies, and teamworking was lacking in applicants for personal service and sales occupations.

Examples
Within the house-building sector, there is currently a shortage of workers with the required skills, which is leading to recruitment difficulties. This is most apparent in the cities and applies mainly to bricklayers, joiners, plumbers and plasterers. There is also a difficulty finding supervisors of the right quality.

There are skill shortages leading to serious recruitment difficulties in the care sector. The skill shortages are most acute within elderly care. The degree of severity varies with geography. More well-off areas have more acute shortages.

There are skill shortages and recruitment difficulties in the aircraft engineering sector. The primary concern is the shortage of systems engineers with some experience.

In terms of skill gaps[25], about one-fifth of establishments in England reported that a substantial proportion of their staff were less than fully proficient in their jobs. Problems were also reported in the workforce's lack of the desired mix of generic and vocational skills.

Example
There are skills gaps in the care sector, with the skills of the majority of the workforce being insufficient to meet the needs of the business fully. Many workers have basic skills needs and there are not enough workers with a Level 2 qualification. That is why the training strategy is in place to train people to Levels 2 and 3. The sector has a long way to go to meet the 50% requirement by 2005. There is a disproportionate number of the workforce with basic skills and ESOL needs. In addition effective communication skills, both verbal and written, and social skills are lacking.

Example
The skills of the majority of the workforce engaged in exercise and fitness are insufficient to meet the needs of the business fully. This applies to the areas of customer service, interpersonal skills, communication and in the demonstration of higher level technical expertise in specific areas, for example in Level 3 exercise and fitness, anatomy and physiology, biomechanics and coaching methodology.

Key point
Skills gaps and shortages seem to be increasingly expressed in terms of a mix of generic and vocational skills.

Growth in intermediate skills

The final report of the National Skills Task Force[26] notes that nearly all the net growth in the demand for intermediate-level skills in the past 25 years has come in 'new jobs' such as design, finance and business services, and leisure, and that most of the employment growth over this period has occurred at the associate professional level. Skill needs in these jobs centre on creativity, communication and associated technical abilities plus an awareness of business performance and its place in the market. Rapidly rising salaries in these occupations suggests that there have been difficulties in attracting people with the right mix of skills. Graduates have filled many of these jobs, perhaps indicating that a sound general education is a sufficient grounding for jobs in this area.

The DfEE's *Labour market and skill trends*[27] refers to the increasing numbers of employees in higher-grade occupations, and to employers' views that the skill requirements for their average employee are increasing. This is mainly due to changes in processes or technology, which have automated many routine tasks, and changes in work practices or multi-skilling. Jobs requiring few skills have largely disappeared.

Key point
An increasing proportion of intermediate jobs are in the service sector, which has been particularly influenced by 'new' jobs. The manufacturing sector has also seen a growth in intermediate jobs. In both sectors of the economy, the need is for skills focusing on creativity, design, communication, and business awareness as well as technical ability.

Example
In broadcasting the content of qualifications at Level 3 is thought to reflect only partly the range of skills required by the majority of the workforce. About 25% of what employees require relates to attitude, lateral thinking and creativity, which are hard to measure effectively or to train up to.

Example
In exercise, health and fitness there has always been a shortage of qualified and occupationally competent individuals who have gained a Level 2 award in exercise and fitness. Exercise to music and gym instructors are significantly lacking. There are shortages among duty and middle managers, in local authority leisure provision and among senior fitness instructors. The sector has now identified the need for Level 3 training in exercise and fitness disciplines, particularly with the expanding relationship between the sector and the Department of Health, which has identified the need for expertise in GP referrals, executive health care, preventative and rehabilitation programmes.

Although employment in craft and technician level jobs has fallen, such workers remain vitally important for most production functions, and an ageing craft workforce means that the number of vacancies is set to grow over the next few years. It is the lack of spare capacity at this level that results in craft and technician-level jobs being so frequently identified as skills shortages when firms seek to expand. The 1999 Engineering and Marine Trades Association (EMTA) survey of engineering firms found that nearly three-quarters of all hard-to-fill vacancies in engineering were at craft and technician level.

Key point
Despite falls in craft- and technician-level jobs, vacancies will grow as a result of an ageing craft workforce.

Example
There are acute skill shortages in engineering leading to recruitment difficulties, and the situation is getting worse. The average age of the workforce is 56. Ten years ago the Engineering Construction Industry Training Board (ECITB) had 250 registered apprentices nationwide. Last year it had 150.

Key points
It is argued that Level 2 rather than Level 3 skills will continue to be sufficient to access the majority of jobs over the next two decades. However, the composition of the skills set at all levels is complex and particular to each occupational context.
A knowledge-driven economy demands changes in vocational skills and also new generic skills that comprise a complex mix of adaptable skills and competences.

Examples
Over the next five years the broadcasting industry will require more jobs requiring IT skills. Technological requirements will increase. Companies will reduce their workforce as they 'contract out' more of their work. More freelancers will be used. This, in turn, will place a greater emphasis on management skills, supervisory and communication skills. The rationalisation of the industry will continue and multi-skilled people will be required.

Over the next five years or so there will be many more people in nursing homes with 'acute' needs. There will be more specialist homes, and a greater emphasis on care in the community and rehabilitation. There is a move towards higher quality services, delivered more individually. A lot more specialist skills and training will be required to provide a higher level of training for the majority of the workforce, There will be a steady increase in the number of Level 3 jobs and more professional qualifications will be needed. Some workers will need generic skills, others will be specialists. Care will be about more individualised support for service users.

Key point
The demand for intermediate skills varies across sectors and between firms of different sizes. The interpretation of intermediate skills will, therefore, be changing constantly over time and at a different rate between sectors.

Financial returns on skills

Peter Robinson [28] argues it is dangerous to assume that the knowledge-driven economy will necessarily result in large numbers of high-skilled, high-paid jobs at the expense of low-paid work.

But the assumed relationship between levels of skill and levels of pay may need to be revisited. As the basic level of ability required to operate effectively in the majority of jobs rises, the premium associated with those skills reduces. The more complex range of interpersonal, generic and vocational skills now required makes a straightforward link between levels of qualification and pay even more difficult.

Recent research[29] has found that the rate of return on earnings to those vocational qualifications most associated with craft and technician level jobs to be considerable; between 5 and 10% per annum for Level 3 qualifications (0NC/0ND) and between 5 and 12% per annum for level 4 qualifications (HNC/HND). This rate of return is comparable to equivalent academic qualifications when calculated on an annual basis to account for the part-time nature of most vocational courses.

However, Robinson proposes a counter view[30] and says that employers send out clear signals through the labour market that academic qualifications result in significantly higher earnings than vocational qualifications at the same level. He argues that Level 3 vocational qualifications yield earnings similar to those that could be expected by someone holding five or more higher grade GCSEs, while earnings of people with A-levels match those of people who achieved Level 3 and then Level 4 vocational qualifications such as an HND.

The key to returns on qualifications may lie in the need for specific qualifications in some jobs and sectors, and not in others. For example, Craft and technician role require specific knowledge and skills to perform the job satisfactorily. These skills must be developed through relevant learning opportunities, both on and off the job. Trainees may be selected by means of school-leaving qualifications, because these are all that they could be expected to hold. The expectation of fully trained staff would be that they hold the relevant vocational qualification and experience to do the job within a short time after being recruited. Jobs in the service sector on the other hand are less likely to have such specific requirements on entry, or in service.

Key point
The demand for intermediate skills varies across sectors and between firms of different sizes. The interpretation of intermediate skills will, therefore, be changing constantly over time and at a different rate between sectors.

International comparisons of intermediate skills

Although the qualifications level of the UK workforce as a whole has risen significantly over the past 20 years, this has been due to the higher qualifications of new entrants to the labour market. There has been little growth in the comparatively low base of the qualifications of the existing workforce.[31] The growth in qualifications gained by young people has favoured academic qualifications and the UK continues to have a problem with the supply of qualified young people with craft-related vocational qualifications: most has been at low levels ie, below NVQ Level 3. A large minority of the workforce still have either low, at Level 2 or below, or no qualifications, and around one-fifth of adults have poor basic skills.[32]

Key point
The growth in vocational qualifications within the workforce has mostly been among the new entrants who mainly hold academic qualifications or vocational qualifications below NVQ Level 3.

Keep and Mayhew[33] note that while international comparisons of workforce skills and competences are difficult, the most reliable comparisons show that the UK still lags behind its major competitors, particularly in vocational qualifications at Levels 2 and 3. The UK still has one-third fewer people qualified to NVQ Level 2 than either France or Germany, and only half as many people qualified to NVQ Level 3 or above as Germany.

Qualifications in the UK, France and the former German Federal Republic

	Level 2+			Level 3+		
	UK	France	Germany	UK	France	Germany
	1998	1998	1997	1998	1998	1997
19–21 year olds, general education	44%	56%	37%	29%	38%	22%
19–21 year olds, vocational	26%	25%	28%	14%	5%	26%
19–21 year olds, total	70%	81%	65%	43%	43%	48%
25–28 year olds, general education	33%	40%	33%	24%	36%	30%
25–28 year olds, vocational	28%	43%	52%	17%	18%	48%
25–28 year olds, total	61%	83%	85%	41%	54%	78%
Workforce, general education	27%	31%	25%	20%	25%	22%
Workforce, vocational	27%	41%	58%	17%	12%	52%
Workforce, total	55%	73%	83%	37%	36%	74%

Lloyd and Steedman 1999[34]

Young people in continental Europe take longer to gain qualifications, particularly vocational qualifications, than in the UK. There is a considerable gap between the UK and Germany in qualifications at Levels 2 and 3 held by 25–28 year olds. Germany has double the proportion of 25-28 year olds at Level 2 and treble the proportion at level 3 compared with the UK. Furthermore, the UK faces a significant gap with some non-European countries; over 90% of 25–28 year olds in Korea and Japan are qualified to Level 3 or above.

Key point
International comparisons of skills are difficult but there is little evidence to show that the UK is closing the gap with its European competitors. The main reasons for the qualifications deficit, when compared to Germany, is the lower proportion of the UK workforce with Levels 2 and 3 vocational qualifications.

Uneven growth in qualifications
The expansion in qualifications in the UK has occurred to a greater extent in some disciplines and subjects than in others. Most of the growth in GCE A-level has been in relatively new subjects such as computing, communication studies and business studies. The growth in more traditional subjects like maths, chemistry and physics has been low in comparison, and entries in physics actually fell during the 1990s. The Task Force's research report[35] points out that the UK has a much smaller supply of individuals who have studied advanced mathematics and physics at age 16 than other countries such as France, Germany, US and Singapore.

The same applies for GNVQs and NVQs. Over half (50%) of all Advanced GNVQs awarded in 1997/98 were in business. Of the 458,000 NVQ/SVQs awarded in 1997/98, fewer than 100,000 were in technical disciplines such as construction, engineering, manufacturing or chemicals, and only 18,000 of these were at Level 3 or higher.[36]

Key point
An important reason for the relatively low take-up of science and technical subjects seems to be that the basis for studying disciplines requiring a mathematical background is not being developed among young people before they complete their compulsory education. Too few acquire good levels of qualification in mathematics.

Relationship to productivity
Government now sees the relationship between skills and productivity as a vital link in securing greater competitiveness. The joint Treasury and DfES report on workforce skills[37], suggests that training and qualifications are more directly associated to productivity gains than to wage gains.

Robinson[38] considered productivity in a number of countries, including seven OECD countries where output per hour worked was significantly higher than in the UK in 1996, eight countries where productivity was not significantly different, and nine countries where productivity levels were significantly lower. The UK comes out in the middle of the table with average levels of productivity. Switzerland, Austria and Denmark have similar levels of productivity as the UK. The superior productivity of Germany attributed in large measure to its system of apprenticeship training, and the high proportion of the workforce with intermediate vocational qualifications. However, Switzerland, Austria and Denmark have both similar training systems and proportion of the workforce with vocational qualification, but productivity is no higher than the UK.

Key point
A high proportion of the workforce holding intermediate-level qualifications will not by itself guarantee high productivity.

Layard, McIntosh and Vignoles[39] estimate that productivity per hour worked in Britain is roughly 20% lower than in Germany, as are real hourly wages. Britain has less human capital and less physical capital per hour worked, and one reason for this, they suggest, is that its low skills attract less physical capital investment. Layard *et al* report that it is at the lower skill levels that Britain does worse than Germany. The top 40% of earners do as well as the top 40% in Germany, but Germany's bottom 40% earn half as much again as the equivalent group in Britain.

The solution to Britain's lower productivity is seen to lie with the bottom 40% of the workforce. Britain does as well as most countries at the HE level, but is way behind Germany in the numbers with A-levels or with advanced craft qualifications. Britain also falls way behind France in numbers with a good performance at GCSE. The authors calculate that nearly half the wage gap between Germany and Britain is due to differences in qualifications, with some of the difference in productivity a result of relative poor levels of literacy and numeracy among the UK's adult population.

As explored earlier in this paper, high skill levels are commonly seen to be crucial to both economic competitiveness and social well-being. It is not thought possible to have a competitive economy without the skills to achieve high levels of productivity. The future prosperity of the country with its high wage economy is linked to being able to produce a growing level of high value added products and services. The productivity of the UK economy lags behind that of many of our competitors as a consequence, in no small measure, of the lower stock of skills available in the workforce.

Where skill levels are low, skill shortages significant, or indeed through individual company choice, an option for some firms is to accept a 'low skill equilibrium', producing low added value products or services which need lower skills levels. The National Skills Task Force saw this as possibly an acceptable option for a small number of firms or in declining sectors, but unacceptable and economically fatal for the economy as a whole.

The developing world will have access to far lower labour costs and similar levels of technology to the UK for the foreseeable future. The first report of the National Skills Task Force[40] saw the only option for the UK was to achieve a high skill, high value added economy in order to retain a significant future place in the global market place.

Key point
The UK, with its high wage economy, needs to produce high value-added products and services. To this end it needs to produce high levels of skill.

Qualifications held in the workforce, 1998 (percentages)

	At least Degree	At least A level	At least ' Good GCSE	Skills Index (UK=100)
Germany	22	74	83	109
France	23	45	73	103
UK	24	36	55	100
US (1994)	22	29	50	97

The skills audit (DfES and Cabinet Office 1996)

Why does the UK compare badly?

Keep and Mayhew's[41] analysis of the historical dimension of the UK's deficiencies in developing an adequately skilled workforce points to the 1980s, when supply-side weaknesses, which resulted in the failure of the full-time education system to deliver the right sort of education to a large enough group of young people, coupled with insufficient work-based training. More recent analyses[42] have focused attention on the demand side, and have stated that, for whatever reason, large numbers of employers did not want or need skilled workers.

Many skill-supply mechanisms are culturally specific and have their roots in the particular national and regional contexts: in their industrial relations, inter-firm networks and the politics of the specific country, which makes transfer of good practice extremely difficult. But the balance between the demand and supply of skills evident in the German VET system appears to be a key component of its success. This balance is largely the result of employers being directly involved in and specifying the content of the supply side, and the supply and demand sides being very closely inter-related and intertwined. Within the UK, the absence of a social partnership, with general acceptance of the benefits of vocational training, is a substantial barrier to the development of a sustained policy for skills development.

Key point
Part of Germany's success appears to rest in the balance in the VET system between the supply of and the demand for skills. The absence of a social partnership is a barrier to the development of this equilibrium in the UK.

How should the VET system respond?
The main criticism of the current VET system is that it has failed to supply employers and the economy with a workforce which has the skills they require. One of the problems has been the need for publicly funded provision to lead to a qualification in order to be justified. Employers need specific skills and they frequently feel that their needs are not met by qualifications. Another problem is that individual learners are not demanding what employers and the economy want. Equally, employers, when driven by short-term goals, do not always demand what is good for the economy.

Examples
In the care sector the content of qualifications at Level 2 is felt adequately to reflect the range of skills required. The content of qualifications is regularly reviewed.

Many people engaged in construction do not fully understand the current classification of skills and qualification levels. NVQs are still treated with a degree of scepticism by some employers but slowly the framework is being better understood.

Some engineering employers believe that the current qualifications adequately meet their needs and the content of qualifications adequately reflects the range of skills required by the workforce. But others do not. A problem is that the broad scope of the NVQs (largely designed by representatives from large companies) results in small companies finding it impossible to give trainees the full range of necessary training opportunities. The main pressures are to increase the flexibility of qualifications, so that they can better be tailored to companies' specific needs and give some recognition to other training, such as vendor training.

The *Skills agenda*[43] concludes that the capacity of the post-16 learning and skills sector to respond to the new skill challenges needs to be developed.

- The curriculum (its content, delivery and assessment) needs to respond to and anticipate these future challenges. Planners and providers must constantly assess whether the skills and knowledge that are currently provided and accredited are appropriate to support economic competitiveness.

- Key players need to articulate and understand new skill demands. Clearer definitions of skills are required. Definitions should be forward-looking and subject to regular review.
- Providers need to develop new learning programmes to meet the changing needs.

Key point
Employers, providers and policy-makers need to be clear about the new skills demands and to secure an appropriate response from providers.

Conclusions and issues

Although the definition of intermediate skills may not be uniform across business and industry, or necessarily required by the mass of the workforce, there appears to be a critical need for a mix of skills at above craft level in a number of sectors. These skills appear to be important in the development of a competitive workforce. The vocational learning system must pay regard to the skill demands and needs of all the different sectors. What is required by most of the workforce in one sector is not necessarily required by most of the workforce in another. One sector may also require much more highly developed technical skills to meet changing demands than another.

Key point
Concepts of what defines skills and levels are not generic and have to be tailored to the different skill needs of individual sectors and sub-sectors.

The structured interviews with sector representatives revealed significant differences in the level of skills at intermediate level, and in the associated skills needs. However, a common theme has emerged in that the crucial issue is the mix of skills now required to operate at a level of some autonomy and responsibility, which is one of the features of intermediate skills. It is unlikely that a blanket equation with a particular level of skills can hold. Nor is the issue of volume of need particularly helpful – intermediate skills appear not to be about a mass requirement for the majority of the workforce, but to be critical for some of the workforce to secure productivity and competitiveness.

The investigation has also exposed a critical flaw in equating intermediate skills with a particular level of qualification, and by implication using qualification achievement as a proxy for estimating skills held by the workforce. The range of skills shortages and gaps described by both employers and others during this investigation are unlikely to be encapsulated by a single qualification, or by successive qualifications in a system of linear progression. Skills and knowledge at higher levels are not necessarily to be found in a single continuum. Here again, it is the mix of skills and knowledge across various levels determined by the particular context that is important.

Policy on skills development
The government's concern to raise levels of attainment in both vocational and academic terms in relation to raising productivity is reflected in some of the PSA targets, for example:

- 'By 2010, 90% of young people by age 22 will have participated in a full-time programme fitting them for entry into higher education or skilled employment'[44]

This target was announced in the Pre Budget Report in November 2002 and relates to raising participation and attainment among young people, particularly those not in

employment, education or training and those in low-skilled jobs without training. The Pre Budget Report talks about achievement of the target requiring 'more support for those that need to progress further with their learning to reach the threshold for skilled employment'.

A further PSA target aims to:

- Reduce by at least 40% the number of adults in the UK workforce who lack NVQ 2 or equivalent qualifications by 2010. Working towards this, one million adults already in the workforce to achieve Level 2 between 2003 and 2005.

Announced in the Spending Review 2002,[45] this target sits alongside the basic skills targets and aims to raise the wider skills of the workforce to secure a more productive economy. The target covers 18–59/64 year olds, and Level 2 is defined as five or more GCSE grades A–C, an intermediate GNVQ, an NVQ Level 2 or any other equivalent qualification.

Given that 'skilled employment' is referred to in the first target could equate with intermediate-level jobs the implications of this report are that the threshold for skilled employment may mean Level 2 in some sectors or Level 3 in others. Clarity about what is meant by intermediate skills could therefore help government to better channel its energies at skill delivery that will enhance national productivity.

Assigning a level to a target may be unhelpful, but the link to skilled employment may be more helpful, providing a definition that is flexible enough to encompass sector and occupational differences can be found.

Implications for the CoVE network

When establishing the CoVE network, the link to higher-level qualifications was seen as important because of its link to the need for specialist staff and facilities associated with more complex provision. CoVEs were envisaged as the basis for the development of a modernised supply system, leading the development of high-level specialised provision. This provision was seen to be largely concerned with updating and re-skilling in line with employers' need to develop their workforce. The reports on the structured interviews reveal a lack of understanding of this concept among some providers and Sector Skills Councils. Further development of the CoVE network requires a more informed awareness of their role in setting the benchmark for higher-level skills and workforce development, rather than skills development at all levels.

Development in work

A frequently occurring theme in the investigation has been the need for the structured development of skills and knowledge while working. It seems unlikely that pre-service training could be sufficient to develop skills required at intermediate levels. An explicit agreement about what employers should expect from pre-service training programmes

and what should be incumbent on them, in terms of induction training and further development, is required.

If the intermediate skills that underpin productivity and competitiveness are to be developed, companies need to put in place structured induction or 'internship', where the skills and knowledge that can only be acquired on the job are delivered as part of a planned training programme.

Appendix: Interview responses: intermediate skills

The following comments on intermediate skills were provided in telephone interviews by experts engaged in the following sectors:

- construction (housebuilding)
- media (broadcasting)
- care
- traditional engineering
- high-tech engineering
- exercise, health and fitness.

For each of the sectors at least three people were interviewed. The hour-long interviews were conducted by LSDA consultants, themselves well-informed experts in these sectors. The sector experts represented SSCs/NTOs, public and private sector training providers, professional asociations, HR managers and company executives.

Construction (house building)

Intermediate-level skills and intermediate-level jobs

- The term intermediate skills is recognised by some in the sector who associate it with above trade skills and with Levels 3+. Others do not recognise the term as in use in the industry.
- Intermediate-level jobs in house building include trade supervisors, trade foremen, site agents, architectural technicians and quantity surveyors.
- Generic, cross-sector skills are needed in addition to specific trade skills

Skill levels and the qualifications framework

- The majority of the workforce requires NVQ Level 2 trade skills as the base level skills for site working. The workforce needing this level of training are mainly tradesmen; bricklayers, joiners, plasterers, carpenters, painters, roofers, tilers, often working on new buildings and refurbishments.
- Level 3 trade skills tend to include higher-level decorative work.
- House building was described as the 'poor relation of construction'. Higher levels of trade skills are required and are in evidence but the level of qualifications held is lower. Many people come into the industry with no apprenticeship training.
- The majority of the workforce requires communication, number skills (calculating) and general 'people skills'.
- The content of qualifications at this level adequately reflects the range of skills required by the majority of the workforce but the NVQ does not prepare individuals sufficiently for the next stage of their career. A bridging mechanism is required to enable employees to move from one level to another, including from Level 3 trade skills to Level 4 professional skills.

- Employers want trainees to take up employment on site as soon as they have achieved a Level 2 qualification. There is, therefore, little incentive for trainees to complete a Level 3 qualification.
- Most people working in the industry do not fully understand the current classification of skills and qualification levels. Employers view NVQs with a degree of scepticism but the framework is slowly becoming better understood. There are relatively few firms wishing to train to NVQ standards. There is still a preference for the workforce to be trained to NC and HNC levels.
- From 2004 all new entrants will have to achieve an NVQ to be able to work on site. One respondent felt that problems for the industry would arise from the desire to achieve a fully qualified ('badged') workforce rather than a fully competent one.
- There are few organisations, even among the large ones, with training programmes designed to develop the skills of apprentices further.
- It is common practice for employers to attach apprentices to a gang of, often subcontracted, workers

Implications for the CoVE network

- Current CoVE criteria require a focus on Level 3 training, but this is too high for the craft trades where for most employees Level 2 is sufficient. Supervisors and site managers require at least a Level 3 qualification.
- Within the sector there is a need for a small number of CoVEs that offer high-quality, leading -edge, specialist training at higher levels. These should focus on higher-order supervisory and management skills within the construction industry. Such a development would be a powerful agent for change. Provision of this sort could be through consortia of CoVEs.

Skills shortages and skill gaps

- Within the house-building sector, there is currently a shortage of workers with the required skills, leading to recruitment difficulties. This is most apparent in the cities and applies mainly to bricklayers, joiners, plumbers and plasterers. Finding supervisors of the right quality is also difficult.
- In contrast, the skills of the majority of the workforce within individual trades are largely sufficient to meet business needs but there is a shortage of the multi-skilled staff required by small building firms.
- The skills lacking in the current workforce include: steel fixing, bar bending, floor covering, wall and floor tiling, dry walling, plastering and decorative brickwork.
- Skills training within full-time training programmes appear to meet the current needs of the majority of the workforce, but are insufficiently flexible. At trade level there is difficulty in attracting apprentices.
- Employers want short-term solutions and do not make provision for in-service training.

Higher-level skills

- About 10–20% of the workforce needs to develop higher-level skills, usually at Level 4, for example, through HNC/HND courses in building studies. Principal additional skills at these levels are in business management. Some larger companies have training schemes for professional and management staff but most do not, and some major builders have no HR facility. Training is, therefore, mostly *ad hoc*.
- There are skill shortages at this level, including higher-level key skills. Graduates readily find employment in the construction industry (with the exception of IT graduates, of whom there is an oversupply).
- Only a small percentage of students continue training beyond Level 3 as they need to pay for their own training at the higher levels.

The future

- Jobs in traditional trade crafts will not change much. There will be greater changes in the use of materials such as plastic and steel, which will require the use of new techniques. The AMA framework would need to be adapted to accommodate these changes. Training schemes and apprenticeships of longer duration will be needed to include Level 4 skills.
- Growth in the use of e-commerce and information and communications technology (ICT) will require good IT skills and a higher level of training, particularly for supervisory and other senior staff (comprising about 20% of the workforce). Even major builders do not currently use IT to a significant degree.
- There was disagreement about the future rate of growth in house building, but general agreement that the job market will remain buoyant.
- New occupations have developed, such as those associated with the manufacture and fitting of window blinds. The skills required in these new occupations are not sufficient to require a full Level 2 qualification. Level 1 qualifications need to be recognised, as some employees working on site need this level of training. Approximately 150 occupations in the sector are not accredited by a recognised level of qualification. The industry is in the process of tackling this large and complex issue.

Media (broadcasting)

Intermediate-level skills and intermediate-level jobs

- The term intermediate skills is not recognised in the broadcasting sector.
- There is a need to differentiate between technical and content skills.
- Intermediate-level jobs are found in a range of technical and craft posts concerned with sets, sound and lights, production coordination, engineering, props, editing, administration and research. They would also be found in some non-technical jobs, such as production secretary.
- Increasingly graduates are taking some of these jobs.

- For the majority of the workforce to perform effectively in this sector vocational skills at Levels 3+ are required. These include IT skills, a good basic technical competence in the handling and maintenance of equipment, and health and safety awareness.
- The majority of the workforce requires good teamwork, IT, organisational, negotiation and communication skills, knowledge of health and safety requirements, and the ability to freelance.

Skill levels and the qualifications framework

- The content of qualifications at Level 3 is thought to reflect only partially the range of skills required by the majority of the workforce. About 25% of what employees need is concerned with attitude, lateral thinking and creativity, which are hard to measure effectively or to train up to.
- Qualifications at Level 3, such as those for electricians, tend to be too general. These staff need on-the-job training in the specific applications of their skills and to develop their skills in real work conditions.
- Employees with Level 3 qualifications are carrying out a wide range of technical and production jobs. These include electricians, camera operators, light and sound engineers, vision mixers, transmission and maintenance engineers, administration and support management staff.
- The current classification of skill and qualification levels is not meaningful in this sector. Many entrants have not got Level 3 qualifications. They learn their skills on the job. People are employed according to their experience and aptitude, not their qualifications. For content and technical staff the main guide to skill level is the portfolio of work and productions in which they have been engaged. A show reel is crucial to securing work.
- The industry does not classify employees in terms of skill and qualification levels and employees are expected to be multi-skilled at a range of different levels. Skills levels, implying a hierarchy, have little meaning.
- Much of the industry is not using the current classification of skill levels. A new classification of skills, which focused on 'standards' and not NVQs or levels, would be welcome. This aspect of skills development and classification needs more research but the sector would welcome a 'pick-and-mix' system that better reflected the skills required.
- NVQs are not thought to reflect the range of skills required by the majority of the workforce adequately, and are not much used. They are seen as too complicated, inflexible and not relevant to the needs of employers.
- Sector representatives disagreed as to whether skill training meets the current needs of the majority of the workforce. Some see it as satisfactory in providing a basic grounding for entrants, others think skills training does not meet needs well. Education and training providers are seen by some to concentrate too much on the theoretical aspects of knowledge and skills development and include too little practical and task-based work.

- Employer training tends to be specific and delivered in a short period of time. Trainees are expected to demonstrate competence within days without the luxury of long periods of training and practice.

Implications for CoVE

- The current emphasis within the CoVE criteria on Level 3 is seen as only partly appropriate to the needs of most workers in this sector, and then with the proviso that the right sort of training is being offered. On the technical side (editing, camera work, electricians, props, graphics, scenes and sets, lighting, sound engineering) Level 3 is the right level but on the content side Level 4 is required.
- Short courses for in-service training are often good, particularly when specifically commissioned by individual companies. But generally, in-service training is variable. Large broadcasters do it, but most of the industry comprises small and medium-sized enterprises (SMEs). are currently developing a 'kite mark' for training providers that is aimed at the private market. This development would perhaps merit further consideration in the context of CoVEs.
- There is a need for a small number of centres of excellence which could offer high-quality, leading-edge and specialist training at higher levels, which would be aimed at the minority of the workforce.

Skill shortages and skill gaps

- There are difficulties in recruiting people for IT-based developments in the industry. Shortages are particularly acute in the areas of:
  - interactive entertainment, as production of games requires programmers and designers at the highest level
  - multimedia, where staff require specific applied skills and are in short supply as the industry is still growing
  - web design.
- Production accountants are always scarce as are production managers and coordinators, producers and people with financial skills.
- There are shortages in engineering at all levels, and they are particularly acute where there is an ageing workforce. Film also has a rapidly ageing profile of technical and craft staff who are not being replaced sufficiently quickly.
- Within the existing workforce there are skills gaps within IT at all levels, and people with financial awareness and freelance acumen. The levels of technical competence are poor. The skills of the existing workforce will become increasingly insufficient to meet the needs of the business fully.

Higher-level skills

- Between 15–20% of the workforce currently needs to develop higher-level skills, for most at Level 4 but some to Level 5. The principal additional skills needed at this level are management and personnel skills, financial acumen, IT and business skills.

The future

- Over the next five years the industry will require more jobs requiring IT skills. There will be more multi-skilling required at all levels. Technological requirements will increase, although there is also likely to be some de-skilling on the technical side as equipment becomes easier to use. These jobs will not necessarily require a higher level of skills development on the part of the majority of employees.
- Companies will reduce their workforce as they 'contract out' more of their work. More 'freelancers' will be used. This, in turn, will place a greater emphasis on management skills, supervisory and communication skills. Rationalisation will continue and multi-skilled people will be required.

Care sector

Intermediate-level skills and intermediate-level jobs

- The term 'intermediate skills' is not used in this sector. The level of skills required depends on the area of care. In homes for the elderly the skills level required will rise to Level 3 but the sector is currently struggling to achieve Level 2 as a baseline among its workers.
- The bulk of the work in nursing homes is at Level 2, with some jobs, such as cleaners, below Level 2. There is no Level 1 qualification in this sector. There may be a few working at Level 3. Where there are specialisms the level will be higher as in health care and the National Health Service. The Care National Standards Commission stipulate that 50% of the workforce should be trained and qualified to Level 2 by 2005.
- The term 'intermediate-level jobs' also does not have any real meaning in this sector. Occupational standards describe the skills required at each level. There are specific skills for each job, but it could be assumed that in care homes intermediate jobs would include managing the clients' daily living requirements, which is at Level 2.
- In hospitals, intermediate-level jobs would involve managing groups of people. These would be Level 3.
- The vocational skills needed by most of the workforce to perform effectively are set out in the occupational standards, and include practical caring skills, safe working, inter-disciplinary skills and relevant knowledge.
- Personal skills and basic/key skills are essential, particularly good communication skills, as are teamwork and problem-solving skills. Employees need to be people-centred. Level 2 is the minimum level of transferable skills required. There are concerns about the methods of delivery and assessment of these skills.

Skill levels and the qualifications framework

- The content of qualifications at Level 2 is adequate for most of the workforce. The content of qualifications is regularly reviewed. At this level of training

employees are typically engaged in personal care in residential care and home care, dealing with clients' needs over 24 hours, working with the elderly, and working with people with learning disabilities and mental health problems.

- Some saw room for improvement in the current classification of skill and qualification levels within the qualifications framework. A 'mix and match' of NVQ units would better meet the needs of the client group and the individual and provide opportunities for progression. Others thought the current classification of skill and qualification levels in the qualification framework is meaningful.
- The big jump from Level 3 to Level 4 was commented on. The requirement for managers to have separate Level 4 qualifications in management and care is not seen to be reasonable. A single Level 4 qualification covering both is needed
- Some saw no difference between the skills taught by training providers and the skills required by employers. Qualifications match job roles, and the NVQ provides the basis of the training. However, some training providers, typically colleges, are seen as providing out-of-date learning programmes. Much in-house training is provided. The needs of the staff, rather than the level of training, is the issue.
- Training providers see a conflict between what employers want and the MA framework. Employers do not want IT and number key skills, and are especially critical of the tests which they see are setting learners up to fail.
- Under 18 years old staff are not allowed to carry out personal care duties. Now that employers can obtain funding for the training of employees over the age of 25 for NVQ only, some are training mature learners rather than young people.

Implications for CoVEs

- Different views were held about whether CoVE criteria should focus on Level 3. Training providers thought this emphasis was appropriate, but it should be recognised that 50% of the workforce are required to be qualified to Level 2. Some thought the emphasis on Level 3 inappropriate and that it hindered engagement with employers. CoVEs encompass all levels, in partnership with employers, to provide workforce development for all staff. CoVEs will maintain credibility though the quality, rather than level, of provision.
- Some saw a need in the sector for a small number of centres of excellence that offer high-quality, leading-edge specialist training at higher levels for a minority of the workforce. It was thought that some providers could do this.

Skills shortages and skill gaps

- There are skill shortages leading to serious recruitment difficulties in this sector. The degree of severity varies with geography. More well-off areas have more acute shortages, particularly in the south west.
- There are shortages in all areas of care and they are exacerbated because of the 18+ rule. Young people may have a Level 2 qualification but because they are under 18 they cannot be employed.

- The skill shortages are most acute within elderly care. One respondent saw the problem as one of recruiting 'good people' rather than skill shortages. If people with the right qualities are recruited they can be trained. Recruitment has been affected because the care industry has been undervalued and maligned, and has poor levels of pay.
- There are skills gaps too at this level, with the skills of the majority of the workforce being insufficient to meet the needs of the business fully.
- A training strategy is in place to train people to Levels 2 and 3. The sector has a long way to go to meet the 50% requirement by 2005. The gaps are in Levels 2 and 3 skills in occupational standards and there is a disproportionate number of the workforce with basic skills and ESOL needs. In addition, effective communication skills, both verbal and written, and social skills are lacking.
- Full-time training provision partially meets the current skill needs of the majority of the workforce. There is a need for some additional specialist aspects of training to be included (for example, neuro-linguistic training). Improved basic skills is an important issue that has to be addressed.
- There is a capacity problem, and some poor provision in schools, colleges and training providers, with GNVQ or VCE courses without placement experience and poor rates of achievement.
- TOPSS commission in-service training but are concerned about the quality of delivery. A capacity problem is perceived and TOPSS have not found an effective way of communicating with colleges about current and future needs. It was suggested that care training should be integrated with the NHS University. All aspects and modes of training should be better integrated.

Higher-level skills

- Estimates of the proportion of the workforce required to develop higher-level skills range from 12% to 30% of the workforce. This variation results from a different interpretation of 'higher level', which ranged from Levels 3–4 to Levels 4–5. There is agreement that higher care occupational skills and management skills at Level 2 are required.
- Skills shortages and skills gaps are also evident, particularly workforce management and service management skills. By 2005 staff in charge of a residential home will have to have Level 4 care and management qualifications.

The future

- Many more people are expected to need care in nursing homes with 'acute' needs over the next five years. There will be more specialist homes, and a greater emphasis on care in the community and rehabilitation. There is a move towards higher-quality services, delivered more individually. More training will be required to provide the specialist skills at a higher level for the majority of the workforce. A steady increase is predicted in the number of Level 3 jobs and

more professional qualifications will be needed. Some staff will need generic skills, others will be specialists.

- Skills should still be classified as they are currently, as levels of competence broken down into broad functions. The occupational standards are still appropriate. But the qualification design may change from the current, limited range of large qualifications to an increased number of smaller qualifications, with a smaller core qualification and an increased continuous professional development (CPD) component.
- There will need to be a lot more flexibility in training to create a more flexible workforce. For example, the 'mix-and-match' NVQ mentioned earlier. This will comprise the mix-and-match of core generic units with optional specialist units.

Engineering (traditional industries: fabrication and welding)

Intermediate-level skills and intermediate-level jobs

- Intermediate skills is not a term commonly used and the sector is more likely to talk in terms of NVQ or vocational qualifications levels (NC/HNC, etc). But given the term, intermediate skills would probably be defined as NVQ Levels 2–3. For training providers in the sector the term generally relates to crafts persons working at a Levels 2–3 equivalent.
- In electronics manufacturing the term intermediate jobs is seen to apply to the higher levels of operators, and to maintenance technicians/engineers. Training providers give examples of intermediate jobs as supervisors, maintenance workers, the CNC machine operator who is also capable of editing the CNC programme, and team leaders.
- In general manufacturing most of the workforce are likely to need mainly operator skills, represented by the NVQ Level 2 'performing manufacturing operations', and the old C&G part 2s.
- The majority of the workforce needs to operate at around the equivalent of NVQ Level 3. As well as Level 3 skills in their own specialism, the workforce is increasingly expected to have some useful transferable technical skills. Thus a welder is expected to have lower level skills as a pipe fitter or plater, and the fitter must also to be a first-line electrician.
- All respondents agreed that the personal skills required by the majority of the workforce include all the key skills: numeracy, literacy, IT, working with others, as well as the ability to understand and impart technical information. Increasingly, familiarity with, and ability to work within one of the modern quality improvement systems is necessary, including the ability to assess and monitor performance, even one's own.

Skill levels and the qualifications framework

- The level of skills required by the majority of the workforce depends on the company product. For general manufacturing the level required is between Levels 2 and 3. Low volume, high-technology products need a correspondingly higher level of skill. In practice, about 80% of the workforce were trained through 'time-served' apprenticeships backed up by C&G qualifications. Many are now 're-qualifying' through NVQs and finding that they have most of the competencies required at Level 3.
- Some employers believe that the current qualifications adequately meet their needs, but others do not. A problem is that the broad scope of the NVQs (largely designed by representatives from large companies) results in small companies finding it impossible to give trainees the full range of necessary opportunities. This leads to poor retention and low framework completion as these firms simply offer apprentices full employee status.
- NVQs can be flexibly tailored to meet job specific needs, even for Foundation Modern Apprenticeships.
- The main pressures are to increase the flexibility of qualifications so that they can better be tailored to firms' specific needs, and give some recognition to other training (such as vendor training). Examples of this are now being developed.
- Those who are dissatisfied with the present system see the main skills missing from qualifications as the highly specialist, sometimes equipment-specific, skills. In addition, softer skills such as team working are considered to be important. Increasingly, the 'technical' skills required may be non-engineering technical skills, for example those related to finance, management, human resources. Some argue that further unitisation of NVQs and recognition of distance travelled is needed.
- AMAs, in particular, sometimes need 'topping up' to suit particular company needs. The most frequent need is a higher level of competency in CAD/CNC/ CAE, with additional courses at Levels 2 and 3 being provided to match these needs. In some cases, firms provide their own specialist equipment so that the training is even more targeted.
- The jobs being carried out by the workforce with Level 3 qualifications typically include high-level operators, for example operating CNC machines and doing minor programming modifications, or maintenance technicians, team leaders and supervisors.
- The current classification of skills and NVQ and equivalent Levels 1 to 5 are now accepted by the industry. It needs to be recognised that, for example, some managers may need to have a skill Level 5 for some aspect of their role but also need to be competent at a lower level in other fields. This is particularly true of small companies where a professional engineer might also have to assume finance and HR roles.

- Despite the changes in qualifications, and possible future changes, the industry remains fairly traditional. The 'crafts–technician' divide still largely applies (though there are better opportunities to cross over), and is reflected in the qualifications. The main problems are seen to be the difficulties of completing the qualifications, the complexity of the framework and the confusing jargon.
- Employers' own training is almost always tightly focused on particular needs. Larger companies tend to train their newly recruited workforce further after they have completed their initial AMA training. Company training is often more job and equipment specific, but not necessarily at a different level. Provider training is more generic and providers seldom have access or funds to train on appropriate equipment.
- Employers (or trainers doing bespoke work for employers) can run high-quality programmes more easily than providers of full-time generic training. They operate in a controlled environment and can focus solely on those particular skills they need to develop. Both the employer and the trainees can see immediate benefits and both are highly motivated.

Implications for CoVE

- Some saw the focus of the CoVE criteria on Level 3 training as right for this industry. A training provider commented that about two-thirds of its income is from 'full-cost' work for industry. Of this only about 3% is directly related to NVQs. Most employers want a quick return from training. CoVEs should more clearly recognise the importance of this work and not focus so much on full-time Level 3 qualifications. Currently CoVEs are based on the 'added value' of Level 3 programmes, but the added value is much higher on bespoke courses. There should be a simple criterion for establishing a nominal level for such programmes.
- Some saw no need in the sector for a small number of centres of excellence which can offer high-quality, leading-edge, specialist training, if the CoVE model is followed. The CoVE model seems to be providing extra equipment and better accommodation. But all this will be out of date soon. The emphasis needs to be on the delivery of excellence. The model to follow is a network of excellence. The network might include present providers, but also needs to draw in the practitioners in industry, for example by including the equipment vendors who have a vested interest in promoting best practice.
- A training provider commented that they would not like to see high-level 'ring-fenced' centres. Some thought it would be better to encourage good providers to develop high-quality provision from basic to higher levels, others were more receptive to the idea but stressed that such centres would need to be very few in number and matched to the specific needs of industry.

Skills shortages and skill gaps

- There are acute skill shortages in this sector leading to recruitment difficulties, and the situation is getting worse. The average age of the workforce is 56. It was reported that 10 years ago ECITB had 250 registered apprentices nationwide. Last year it had 150. The short-term contract nature of the business, often with much travelling between contracts, means that many young trained workers drop out.
- There are critical shortages at Levels 3 and above. Below this, staff can generally be trained to perform satisfactorily and consistently.
- Shortages of people with higher-level technical qualifications are apparent, and for those with good marketing and management skills. Another provider noted the particular shortage of maintenance engineers (technicians), especially electrical, possibly due to recent over use of subcontractors.
- Shortages exist at all levels, from Levels 2 to 5. The expected warship construction contracts in the north-east region are going to cause acute labour problems. There is a need to provide money to enable trainers to 'build skills for stock', ahead of the actual demand.
- As far as the skills of the current workforce are concerned, the production side of the industry seems generally well provided. There is a particular problem with maintenance staff previously rigidly classified as fitters, electricians, and so on, and this has led to providers supplying training courses in multi-skilling. It was noted that a technical cultural change was needed. When the current workforce was trained it was in 'build' skills. Much of the build work has gone. The emphasis is increasingly on repair, maintenance and decommissioning. Most electronic companies are fairly recently set up and situated where there is an abundance of labour with a technical background (steel, chemical, ship, mining). The requirement is generally to convert the workers to an equivalent skill level in the new sector.

Higher-level skills

- The proportion of the workforce currently required to develop higher- level skills will vary with the company and its product. One training provider estimated the figure to be about 15% of the technical workforce on average. Another suggested that the proportion required to develop higher-level skills was about 25%. This proportion has been changing across the whole of engineering. Twenty years ago the ratio of operators–technician+ stood at about 80:40. Recent surveys in Wales show that the ratio is commonly now 60:40, and likely to get smaller if 'mass customisation' – where a production plant can customise each product to suit individual customers rather than producing identical products – becomes the norm.
- The principal additional skills required at this higher level include advanced transferable skills, for example, communication, business knowledge, management, leadership, teamworking, strategic thinking. On the technical side,

design and development skills and the ability to deal with unique specifications and technical problems are required.

- There are increasingly skill shortages and skill gaps at the higher levels. The main problem is the quality of recruits at 16+ and 18+. An interesting recent trend is the rise in the average ability of AMA entrants. One training provider is seeing more youngsters who have done AS level and then left school, or done a full-time national diploma and decided not to go to higher education. These slightly more mature recruits are often more successful than younger entrants. The problem is illustrated by the fact that Electrical Installation Construction Training Board (EICTB) puts 12–15 high-level engineers through an MBA programme to raise their business skills and awareness. Last year, of the 12 completers, eight immediately went into the City, leaving engineering completely.

The future

- Over the next five years or so the sector will be affected by increasing globalisation, and by industries' ability to separate totally the production function from other areas such as research, marketing and so on. Technical staff increasingly have to meet and work with technical staff from overseas. Much more of the production function might go overseas. Competitors such as Korea, which had previously been particularly successful in capturing some of the mass production business, are also increasingly realising that higher-level functions need developing. 'Mass customisation' might help the UK to retain its production function.
- There will be more new technology on the equipment being used. This will demand a greater facility with ICT. The continuing move towards repair, maintenance and decommissioning will all require greater flexibility. Many workers will have to have a broader range of technical skills and will need to be multi-skilled rather than specialists.
- These changes will require a higher level of training for skill enhancement, rather than higher levels of skills. They will require both narrow, highly specific skills, and broader transferable skills. Jobs will need people who are skilled in just-in-time (JIT) learning, able to address a new problem, understand associated systems quickly, solve the problem, and move on.
- Although the range of skills required will be additional, they will be bolt-on skills rather than a different level. There is, therefore, no value in changing the classification of skills and levels; in changing the Levels 1–5 concept. But there will be an increasing requirement to recognise that a mix of levels might be necessary in a work role. Also, the Levels 1–5 classification suggests a single progression route, but increasingly business needs and career aspirations require individuals to change functions. These transfers need to be better addressed.

Engineering (high-tech industries)

Intermediate-level skills and intermediate-level jobs

- The term intermediate-level skills does not mean anything to the high-tech industries, who talk of NVQ levels or job requirements. The term intermediate-level jobs is also not used. .
- One company employs 'operatives' who are recruited with good GCSEs or NCs, 'maintenance engineers/technicians' who have NCs or HNC, 'process engineers' who have an HNC or a degree, and 'technology engineers', who mostly have a degree. 'Intermediate-level skills' for this company are associated with maintenance and process engineering, that is skills around the HNC level.
- At the same company, almost all the operators are well above the basic craft level. The company has just set up a new operative structure of six levels. Entrants are expected to have achieved NVQ Level 2 'performing manufacturing operations' in their first year, and most will be at NVQ Level 3 by the end of the second year. The plan is for the best then to become 'technician operators', eventually progressing to 'lead production operator' status, when they will also have to have a NEBS qualification. Intermediate-level jobs are thought of as the higher 'maintenance' and process engineering jobs. The majority of the workforce are required to have high levels of skill in the operation and maintenance of state-of-the-art production equipment.
- The personal skills required by the majority of the workforce in this sector are the key skills of numeracy, communication and team-working.
- The level of skill required in the sector by the majority of the workforce is Level 3+. One respondent commented that as their plant grows and more products are developed, the proportion of operatives will increase and they will become the majority, requiring skills at about Level 3.

Skill levels and the qualifications framework

- The content of qualifications at Level 3 is considered adequately to reflect the range of skills required by the majority of the workforce. Within one of the companies, the skills training department is the sole supplier of training to a single company. The content of all qualifications is tailored to the company's needs.
- As far as the classification of skill and qualification levels within the qualifications framework is concerned, one company considered the classification as NVQ levels to be useful. However, on the production floor, many of the workforce have no recognised NVQ. They hold apprenticeships from years ago or academic/ vocational qualifications in unconnected subjects.
- For another company, the content of qualifications at Level 3 does not adequately cover the range of skills required by most of the workforce. Much of the training required is equipment specific. However, the company is very enthusiastic about the success of a flexible NVQ Level 3 programme developed

in partnership with the provider, a group of companies and leading advisers from the industry. Previously awards could not be sufficiently company specific.

Implications for CoVE

- For one of the providers the focus on Level 3 training within the CoVE criteria is appropriate, but others did not agree. More general training providers develop their business with as many employers as possible and can increase Level 3 overall. For many companies the output of trained personnel is determined by the needs of a single business, and these needs change. Although Level 3 is an appropriate focus currently, more Level 3 training may not be needed for some years, and the AMA programmes would be scaled down and training delivered at different levels, perhaps concentrating on re-skilling the current workforce.

Skills shortages and skill gaps

- There are skill shortages and recruitment difficulties in some of the specialist engineering firms. The primary concern is the shortage of systems engineers, with some experience. The ideal team for one organisation has systems engineers who have been specialist graduates, ex-apprentices who have moved into systems, and well-experienced engineers. Graduates are coming through but there are too few with industrial experience.
- There is no well-defined gap in the skills of the majority of the workforce, but this is an industry where the workforce is constantly being updated, retrained, and multi-skilled. There is a constant increase in applications of new technologies, and these lead to labour surpluses that are retrained in other skills. For example, there is a current shortage of skilled electricians. In some firms fitters are being re-trained so that they can take on the lower level electrician tasks, allowing the existing electricians to concentrate on advanced work.
- For one company full-time training can currently only meet the needs at the very basic NVQ 2 level. All the rest is through in-service training, often through equipment vendors. The company has no AMA programme yet, nor any postgraduate training programme, but there are plans for both. All training for one of the specialist companies is in effect in-service training in that training is tightly focused on the particular needs of the industry.

Higher-level skills

- At one organisation, about 1/3 of the workforce is currently working with higher-level skills. Of these about half require Level 4 or HNC skills, and about half are working at Level 5 or degree level. The skills required at these higher levels are higher specialist technical skills, plus high communication skills and project management skills. There are severe skill shortages at these higher levels. However, the proportion working at higher levels is likely to fall as the number of operators increases in relation to the process and technology engineers.

- There is a difficulty in definition for one of the firms. Many on the production floor have very high skill and knowledge levels in narrow areas. The company contains some who are acknowledged world experts in a narrow specialism.
- The emphasis within CoVEs is on high quality Level 3 provision with progression to higher-level skills. One respondent thought that it could be a good idea for a small number of centres of excellence to be identified which could offer high-quality, leading-edge specialist training. A small number of HE institutions used to hold a series of engineering 'master classes' given by world experts, which were very valuable. Another commented that there is a need to support a small number of high-quality training centres in specific specialisms, such as their field of work. The respondent suggested that in the CoVE programme too many of the engineering CoVEs are too general.

The future

- As far as future jobs are concerned, the products of high-tech companies are changing rapidly containing more computer technology, and, therefore, jobs are changing rapidly. These jobs require new technical skills and an increasingly flexible workforce.
- These new jobs will not require a higher level of skills but a different set of competencies. It was noted by one firm that the NVQ system has improved rapidly. Previously, the content of the NVQs was fixed and largely determined the product, ie the trained personnel. Now the business determines the product and can mould the NVQ to fit. Qualifications have to be flexible to match the nature of business.
- A new classification of skill levels will, therefore, not be required. The NVQs and their levels are becoming established and the respondents insisted that no change was required or desirable. Employers can work within the existing system.
- In another of the specialist organisations the proportion of the workforce needing skills above Level 3 will decline over the next five years, though the actual numbers will increase. Given a healthy market, the proportion requiring Level 3 skills will increase rapidly. The greatest need will be for flexibility, with employees able to do more than one type of job, and perhaps at different levels.
- New recruits working as operators will continue to require the same sort of training, but those moving up the scale will increasingly need additional training in specialist skills and in personal/transferable skills.
- As far as the classification of skill levels is concerned, one of the high-tech companies stated they did not believe in rigid levels of skills and qualifications because such a system tends to raise barriers to the sort of flexibility the organisation requires.

Exercise, health and fitness

Intermediate-level skills and intermediate-level jobs

- Intermediate-level skills are those identified in NVQ Level 2 in coaching, teaching and instructing. This includes all exercise and fitness disciplines. They include the skills demanded by a supervisory position or lead exercise instructors or personal trainers.
- Intermediate-level jobs include those carried out by supervisors with line-management responsibility, gym instructors/personal trainers, with an element of autonomy. The MA framework details intermediate jobs.
- The vocational/technical skills required by the majority of the workforce in this sector if they are to perform effectively are set out in the Workforce Development Plan for the sport and recreation sector. This details the top 20 skills ranked by employers. Heading this list are:
- communication,
- health and safety,
- customer service,
- personal skills (interest, motivation, inter personal skills, leadership),
- softer key skills such as working with others, and
- technical knowledge relating to the discipline.

Skill levels and the qualifications framework

- The skills required by most of the workforce, such as those required for fitness instructor, are predominantly at Level 2, although there is a need to develop Level 3.
- Level 2 qualifications are fit for purpose at this stage. However, not all personal and interpersonal skills required by the industry are contained within current qualifications. The sector also needs a broader range of specific qualifications, which are not currently available in the national qualifications framework. The new standards do incorporate the required skills as identified in the sector's task force development plan.
- The jobs employees with this level of qualification hold include exercise and fitness instructor, personal trainer for group and individual instruction.
- Employers still lack knowledge and understanding of the current classification of skill and qualification levels and of the qualification framework . They may not value the qualification or appreciate it as being required for the individual to do the job.
- However, employers are now becoming more aware, due to the formation of the Register for Exercise Professionals, which is linked to the qualifications in the National Qualifications Framework.
- Historically there have been differences, between the intermediate skills defined and developed by providers training within the qualifications framework, and the

skills required by employers doing their own training outside the qualifications framework. But due to the register, employers now have a choice between the types of qualifications that they wish their employees to have. Employers still may employ individuals who demonstrate a high level of interpersonal skills over an individual who has the desired qualification, but lacks the personal skills identified above.

- There are now three established CoVEs within this sector and the possibility of another two, including a private learning provider. There is scope for a small number that have the technical expertise to deliver training at Levels 3 and 4. However, only one or two private learning providers would be capable of offering such provision. There is a need for the sector to link with the Department of Health much more closely and this is where the CoVEs could play an important role.

Implications for CoVE

- With regard to the focus in the CoVE criteria on Level 3 training, the sector has a large cohort of personnel who are qualified to Level 2, which has been the required level to date. But Level 3 qualifications have recently been identified as needed for a specific number of the workforce, due to a demand for individuals to be trained in the GP referral schemes, which require a Level 3 standard, and for junior management staff to receive appropriate specific training in a higher level of underpinning knowledge.

Skills shortages and skill gaps

- There has always been a shortage of qualified and occupationally competent individuals who have gained one of the Level 2 awards in exercise and fitness. Competent exercise to music and gym instructors are significant areas of need. There are shortages among duty and middle managers, in local authority leisure provision and among senior fitness instructors. Historically the sector has a high turnover of staff and so there will be a continuing need for training at Level 2.
- The sector has now identified the need for Level 3 training in exercise and fitness disciplines, particularly with the expanding relationship between the sector and the Department of Health, which has identified the need for expertise to be developed in GP referrals, executive health care, preventative and rehabilitation programmes.
- The skills of the majority of the workforce are insufficient to meet the needs of the business fully within the areas of customer service, interpersonal skills, communications and in the demonstration of higher-level technical expertise in specific areas, for example in Level 3 exercise and fitness, anatomy and physiology, biomechanics, kinesiology, coaching methodology and technical knowledge relating to specific disciplines. ICT skills are now being developed through other routes.

- Within full-time training it is the focus of the new SSC, Active Skills, to identify the training needs of the majority of the workforce and ensure that high-quality training is offered throughout the range of qualifications.
- As far as in-service training is concerned, there are still gaps and the current needs of the workforce are not fully met, particularly with regard to competent instructors, who can demonstrate a high level of communication skills as well as being competent instructors.

Higher-level skills

- Between 30–40% of the workforce require skills above Level 2, with 10–15% requiring a Level 4 qualification. At this higher level the need is principally for management skills, personal skills, counselling skills, advanced first aid at work, and in the prescription of exercise for special populations and referred populations.
- At higher levels there are skill shortages. Until Level 4 qualifications are offered in the National Qualifications Framework there will continue to be gaps at this level. Institute of Leisure Management(ILM) qualifications help to fill these gaps, but there are few qualifications that fully address the needs identified at present.

The future

- Over the next five years the need for qualified competent instructors at Level 2 will not change due nor will the job roles significantly. These have been established over a long period. Minor changes will involve the increase of Level 3 qualified personnel in prescriptive exercise programmes. These jobs will require greater management skills and a higher level of technical competence and under pinning knowledge.
- A greater emphasis on training and qualifications will be brought about as a result of the growth of the Register of Exercise Professionals. This is now recognised as the tool that enables employers to understand the range of qualifications in the National Qualifications Framework, and the need for individuals to undertake training that is fit for purpose and to achieve a qualification that is recognised and has currency.
- There will not be any need for a new classification of skill levels. These have already been identified by the SSC for the sector and have been referenced in the workforce development plan.

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